


CLAIMS

5  1. A method of performing a recoverable operation on a message queue in response to a request by a caller in an information handling system, said method comprising the steps of:
storing a use count for said message queue indicating the number of tasks accessing said queue;
storing a use count flag for said caller indicating whether said caller has acquired a lock on a queue;
updating said use count; and
10 atomically with updating said use count, updating said use count flag to indicate whether said caller has acquired a lock on said queue.

15 2. The method of claim 1 in which said recoverable operation is a locking operation, said step of updating said use count comprising the step of incrementing said use count, said step of updating said use count flag comprising the step of updating said use count flag to indicate that said caller has acquired a lock on said queue.

20 3. The method of claim 1 in which said recoverable operation is an unlocking operation, said step of updating said use count comprising the step of decrementing said use count, said step of updating said use count flag comprising the step of updating said use count flag to indicate that said caller has released a lock on said queue.

25 4. The method of claim 1, comprising the further step of:
comparing said use count with a previously read use count atomically with said updating steps, said updating steps being performed only if said use count matches said previously read use count.

30 5. The method of claim 4 in which said use count is stored in a message queue table having an entry for said message queue.

6. The method of claim 5 in which said message queue table also stores a pointer to said queue, said method comprising the further step of:

comparing said pointer with a previously read pointer atomically with said updating steps, said updating steps being performed only if said pointer matches said previously read pointer.

7. The method of claim 5 in which said message queue table also stores an identifier of said queue.

8. The method of claim 1 in which said use count flag is stored in a control block for said caller.

9. The method of claim 8 in which said control block for said caller also contains an identifier of said queue.

10. The method of claim 1 in which said updating steps are performed by executing a single atomic instruction that updates said use count and, concurrently therewith, updates said use count flag.

11. A method of assigning a message from a sender to a waiter in an information handling system, comprising the steps of:

storing respective first and second control blocks for said sender and said waiter, said first control block having a first pointer to said message, said second control block having a flag that is set to indicate that a message is paired with said waiter as a receiver and a second pointer to a message that is paired with said waiter as a receiver;

updating said first pointer to point to null; and

atomically with updating said first pointer, updating said flag to indicate that said message is paired with said waiter as a receiver and updating said second pointer to point to said message.

12. The method of claim 11, comprising the further step of:
comparing a comparison field of said second control block with a predetermined first value atomically with said updating steps, said updating steps being performed only if said comparison field matches said predetermined first value.

13. The method of claim 12, comprising the further step of:
updating said comparison field to a predetermined second value atomically with said comparing step if the comparison field matches said first value.

14. The method of claim 11 in which said first and second pointers point to said message through a third control block having a pointer to said message.

15. The method of claim 11 in which said updating steps are performed by executing a single atomic instruction that updates said first pointer and, concurrently therewith, updates said flag and said second pointer.

16. A method of assigning a message to a caller in an information handling system, comprising the steps of:
storing respective first and second control blocks for said caller and said message, said first control block having a pointer to a message that is paired with said caller as a receiver, said second control block having a flag that is set to indicate that said message is paired with a receiver;
updating said pointer to point to said message; and
atomically with updating said pointer, updating said flag to indicate that said message is paired with said caller as a receiver.

17. The method of claim 6, comprising the further step of:
comparing a comparison field of said second control block with a predetermined first value atomically with said updating steps, said updating steps being performed only if said comparison field matches said predetermined first value.

18. The method of claim 7, comprising the further step of:
updating said comparison field to a predetermined second value atomically with said
comparing step if the comparison field matches said first value.

19. The method of claim 6 in which said second control block has a pointer to said message.

20. The method of claim 6 in which said updating steps are performed by executing a single
atomic instruction that updates said pointer and, concurrently therewith, updates said flag.

21. A method of facilitating recovery in an information handling system, comprising the steps
of:
performing a recoverable action; and
atomically with performing said recoverable action, setting a footprint indicating that said
recoverable action is being taken.

22. The method of claim 21 in which said recoverable action is an action on a queue.

23. The method of claim 22 in which said queue is a message queue.

24. Apparatus for performing a recoverable operation on a message queue in response to a
request by a caller in an information handling system, comprising:

means for storing a use count for said message queue indicating the number of tasks
accessing said queue;

means for storing a use count flag for said caller indicating whether said caller has
acquired a lock on a queue;

means for updating said use count; and

means for updating said use count flag atomically with updating said use count to indicate
whether said caller has acquired a lock on said queue.

25. The apparatus of claim 24, further comprising:

means for comparing said use count with a previously read use count atomically with said updating operations, said updating operations being performed only if said use count matches said previously read use count.

26. The method of claim 25 in which said use count is stored in a message queue table having an entry for said message queue, said message queue table also storing a pointer to said queue, said method comprising the further step of:

comparing said pointer with a previously read pointer atomically with said updating operations, said updating operations being performed only if said pointer matches said previously read pointer.

27. Apparatus for assigning a message from a sender to a waiter in an information handling system, comprising:

means for storing respective first and second control blocks for said sender and said waiter, said first control block having a first pointer to said message, said second control block having a flag that is set to indicate that a message is paired with said waiter as a receiver and a second pointer to a message that is paired with said waiter as a receiver;

means for updating said first pointer to point to null; and

means for updating said flag atomically with updating said first pointer to indicate that said message is paired with said waiter as a receiver and updating said second pointer to point to said message.

28. The apparatus of claim 27, further comprising:

means for comparing a comparison field of said second control block with a predetermined first value atomically with said updating operations, said updating operations being performed only if said comparison field matches said predetermined first value.

29. The apparatus of claim 28, further comprising:

means for updating said comparison field to a predetermined second value atomically with said comparing operation if the comparison field matches said first value.

5 30. Apparatus for assigning a message to a caller in an information handling system, comprising:

means for storing respective first and second control blocks for said caller and said message, said first control block having a pointer to a message that is paired with said caller as a receiver, said second control block having a flag that is set to indicate that said message is paired with a receiver;

10 means for updating said pointer to point to said message; and

means for updating said flag atomically with updating said pointer to indicate that said message is paired with said caller as a receiver.

15 31. The apparatus of claim 30, further comprising:

means for comparing a comparison field of said second control block with a predetermined first value atomically with said updating operations, said updating operations being performed only if said comparison field matches said predetermined first value.

20 32. The apparatus of claim 31, further comprising:

means for updating said comparison field to a predetermined second value atomically with said comparing operation if the comparison field matches said first value.

25 33. Apparatus for facilitating recovery in an information handling system, comprising:

means for performing a recoverable action; and

means for setting a footprint atomically with performing said recoverable action indicating that said recoverable action is being taken.

34. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for performing a recoverable operation on a message queue in response to a request by a caller in an information handling system, said method steps comprising:

5 storing a use count for said message queue indicating the number of tasks accessing said queue;

storing a use count flag for said caller indicating whether said caller has acquired a lock on a queue;

updating said use count; and

10 atomically with updating said use count, updating said use count flag to indicate whether said caller has acquired a lock on said queue.

35. The program storage device of claim 34, said method steps further comprising:

15 comparing said use count with a previously read use count atomically with said updating steps, said updating steps being performed only if said use count matches said previously read use count.

36. The program storage device of claim 35 in which said use count is stored in a message queue table having an entry for said message queue, said message queue table also storing a pointer to said queue, said method steps further comprising:

20 comparing said pointer with a previously read pointer atomically with said updating steps, said updating steps being performed only if said pointer matches said previously read pointer.

37. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for assigning a message from a sender to a waiter in an information handling system, said method steps comprising:

5 storing respective first and second control blocks for said sender and said waiter, said first control block having a first pointer to said message, said second control block having a flag that is set to indicate that a message is paired with said waiter as a receiver and a second pointer to a message that is paired with said waiter as a receiver;

updating said first pointer to point to null; and

10 atomically with updating said first pointer, updating said flag to indicate that said message is paired with said waiter as a receiver and updating said second pointer to point to said message.

38. The program storage device of claim 37, said method steps further comprising:

15 comparing a comparison field of said second control block with a predetermined first value atomically with said updating steps, said updating steps being performed only if said comparison field matches said predetermined first value.

39. The program storage device of claim 38, said method steps further comprising:

20 updating said comparison field to a predetermined second value atomically with said comparing step if the comparison field matches said first value.

40. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for assigning a message a caller in an information handling system, said method steps comprising:

storing respective first and second control blocks for said caller and said message, said first control block having a pointer to a message that is paired with said caller as a receiver, said second control block having a flag that is set to indicate that said message is paired with a receiver;

updating said pointer to point to said message; and

atomically with updating said pointer, updating said flag to indicate that said message is paired with said caller as a receiver.

41. The program storage device of claim 40, said method steps further comprising:

comparing a comparison field of said second control block with a predetermined first value atomically with said updating steps, said updating steps being performed only if said comparison field matches said predetermined first value.

42. The program storage device of claim 41, said method steps further comprising:

updating said comparison field to a predetermined second value atomically with said comparing step if the comparison field matches said first value.

43. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform method steps for facilitating recovery in an information handling system, said method steps comprising:

performing a recoverable action; and

atomically with performing said recoverable action, setting a footprint indicating that said recoverable action is being taken.